

### **REMARKS**

Claims 13-18 are pending in the instant application. Claims 13-18 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claims 13-18 further stand rejected under 35 U.S.C. §102 as being anticipated by Barkemeyer et al (J. Magnetic Resonance, 1996, p. 129-1-132) and by Golman et al (WO99/24080, US 6,574,495). Further, claim 18 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13-18 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the claims of US 10/526,134. The application has been amended. Claim 18 has been amended. Applicants respectfully submit that none of the amendments constitute new matter in contravention of 35 U.S.C. §132. Reconsideration is respectfully requested.

Claims 13-18 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. This rejection is respectfully traversed.

Specifically, the Office again contends

**“[t]here is no description of the claimed hydrogenatable, unsaturated substrate compound required to make and use the contrast agent broadly claimed. There is no description provided regarding what type of specific chemical moieties are used to represent the substrate that would render such a compound to be useful as a contrast agent. “**

Applicants respectfully submit that the Office's objection is not beginning from a proper reading of the claims. The Office's objections are directed to a substrate compound in general, while the instant claims require that the substrate also include imaging nuclei. Each of the Office's objections stay directed to the broader 'substrate compound' without the required limitation of having imaging nuclei. The instant application describes imaging nuclei on page 2, first paragraph and page 5, lines 9 to 12 (PCT specification).

The Office, however, concludes that there is a failure to describe what compounds are encompassed by the term 'substrate compound' and that while specific contrast agents have been described, such

**“does not provide guidance to the specific identity or physical/chemical structure of the variable which represent a substrate...”.**

Again, Applicants respectfully submit that the claims are not directed to 'any' unsaturated compound, but to unsaturated substrate compounds comprising imaging nuclei. The Office's mischaracterization of the claim ignores this limitation and improperly broadens the claim scope. Therefore, given the Office's mischaracterization of the instant invention, the rejection is based on a faulty premise. Applicants again respectfully submit that given the examples in the instant application that one of ordinary skill in the art would know how to select an unsaturated substrate compound based on the desired contrast agent.

Therefore, as the instant application both describes the technology for which patent protection is sought and does so in a way which clearly establishes possession of the invention, Applicants respectfully submit that the written description requirement has been met. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 13-18 stand rejected under 35 U.S.C. §102 as being anticipated by Barkemeyer et al. This rejection is respectfully traversed.

Barkemeyer discloses methods for transferring polarization generated by parahydrogen induced polarization to heteronuclei such as  $^{13}\text{C}$ . Barkemeyer describes a method of applying oscillating magnetic fields in the presence of a stationary magnetic field. Contrary to the claims of the instant application, Barkemeyer does not describe the use of pulses of magnetic fields in which two subsequent pulses have different orientation. Since Barkemeyer does not disclose a magnetic field treatment which comprises a series of pulses wherein each pulse has a different orientation to the prior pulse, i.e. features of the claims of the present application, claims 13-18 are novel in view of Barkemeyer.

Moreover, Barkemeyer is not directed to a method for producing contrast agents. Applicant respectfully submits that the magnetic field treatment of the method of the present invention further increases the degree of polarization of the MR contrast agent, especially the polarization of carbon atoms within the MR contrast agent produced according to the claimed method. Barkemeyer thus fails to disclose, teach, or suggest that such a further increase of the polarization could be achieved by the use of pulses of magnetic fields in which two subsequent pulses differ in orientation.

Therefore, Barkemeyer fails to disclose a method of preparing a contrast agent including the method steps as instantly claimed. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 13-18 stand rejected under 35 U.S.C. §102 as being anticipated by Golman et al. This rejection is respectfully traversed.

In the method of the present invention the contrast agent is exposed to a series of sudden field changes. The field changes are characterized by sudden, step-like increases and decreases for enabling spin-order to be transferred from protons in the hydrogenated contrast agent to polarization of a nucleus within the same molecule. A high degree of polarization of the imaging nuclei spins is achieved by the method of the invention. Golman et al is directed to a method of magnetic resonance investigation of a sample comprising reacting para-hydrogen enriched hydrogen with a hydrogenatable MR imaging agent precursor containing a non-hydrogen non-zero nuclear spin nucleus. The hydrogenated MR imaging agent may be administered to the sample and exposed to radiation to excite nuclear spin transition of the non-zero nuclear spin nucleus from said sample. Therefore, Golman does not disclose a method for enhancing the polarization of imaging nuclei.

In contrary to the claims of the present application, Golman et al does not describe the use of pulses of magnetic fields in which two subsequent pulses have different orientation.

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As Golman et al does not disclose a magnetic field treatment which comprise a series of pulses wherein each pulse has a different orientation to the prior pulse, i.e. features of the claims of the present application, claims 13-18 are novel in view of Golman. Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 18 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully submit that this rejection stands obviated by amendment of the term “the constant magnetic field” to “the magnetic field is at a constant level”, using the language of claim 15. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 13-18 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the claims of US 10/526,134 of the same applicant. Applicants respectfully submit that this rejection stands obviated by the filing of a terminal disclaimer over the cited reference. Reconsideration and withdrawal of the rejection are respectfully requested.

In view of the amendments and remarks hereinabove, Applicants respectfully submit that the instant application, including claims 13-18, is in condition for allowance. Favorable action thereon is respectfully requested.

Any questions with respect to the foregoing may be directed to Applicants' undersigned counsel at the telephone number below.

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The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment, in connection with this Response to Deposit Account No. 502-665 in the name of GE Healthcare, Inc.

Respectfully submitted,

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